Title (en)

COMPACT CYCLOTRON

Title (de)

KOMPAKTES ZYKLOTRON

Title (fr)

CYCLOTRON COMPACT

Publication

EP 3244710 B1 20180905 (EN)

Application

EP 16169497 A 20160513

Priority

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Abstract (en)

[origin: EP3244710A1] The present invention concerns compact isochronous sector-focused cyclotrons having reduced dimensions and weight compared with state of the art cyclotrons of same energies. A cyclotron according to the present invention two pole magnets 2 facing each other in a chamber defined by a yoke comprising base plates 5 and flux return yokes 6 forming a lateral wall of the chamber. The magnet poles comprise N = 3 to 8 hill sectors 3 alternating with a same number of valley sectors 4 distributed about a central axis, Z. The valley sectors comprise a bottom surface 4B, defined by a valley peripheral edge 4vp and provided with an abyssal opening 11, extending through a thickness of the base plates. The lip of the abyssal opening is positioned at a distance, Lap, of the corresponding valley peripheral edge. The flux return yoke 6 has a thickness, Tv, in the portions facing valley sectors, such that the ratio, (Lap x Tv) / Lv 2 , of the product of the distance, Lap, of the abyss perimeter to the valley peripheral edge of each valley sector times the flux return yoke thickness, Tv, to the square of the distance, Lv, of the peripheral edge to the central axis, Z, is less than 5%, wherein each of Lap, Tv, and Lv are measured along an abyss radial axis, Lar. This allows more compact and lighter cyclotrons to be produced than hitherto available.

IPC 8 full level

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